

REMARKS

Claims 1 through 10 and 12 through 14 and new Claims 15 and 16 are pending in the application.

Claims 1 and 13 have been amended to reflect advantageous casings in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 % at 23 °C. Support for this amendment can be found in the Application-as-filed, for example on Page 4, lines 5 through 8.

Claims 1 and 13 have also been amended to reflect advantageous casings having a surface energy of greater than 35 dyn/cm. Support for this amendment can be found in the Application-as-filed, for example on Page 3, lines 13 through 15 and Page 3, lines 33 through 34.

Claim 3 has been amended to conform to Claim 1 as-amended.

Claims 15 and 16 have been added to complete the record for examination and highlight advantageous embodiments of the invention.

Claim 15 is directed to advantageous embodiments in which the liquid smoke further comprises a viscosifier. Support for this amendment can be found in the Application-as-filed, for example in on Page 4, line 34 through Page 5, line 1.

Claim 16 is directed to advantageous embodiments in which the viscosity of the liquid smoke ranges from 15 s to 18 s (measured using the Ford4 cup). Support for this amendment can be found in the Application-as-filed, for example on Page 8, lines 34 through 35 and Page 8, lines 9 through 10.

Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

*The Claimed Invention is Patentable
in Light of the Art of Record*

Claims 1 through 8 and 12 through 14 stand rejected over United States Patent Application Publication No. 2003/0059502 to Krallman et al., which matured into United States Patent No. 7,022,357 ("US 357"), in light of United States Patent No. 5,399,427 to Stenger et al. ("US 427"); United States Patent No. 6,221,410 to Ramesh et al. ("US 410") and United States Patent No. 4,897,295 to Erk et al. ("US 295").

It may be useful to briefly consider the invention before turning to the merits of the rejection.

Applicants respectfully reiterate that conventional liquid-smoke-impregnated food casings, such as those disclosed in US 357, typically require an absorption time of at least 5 days. Even with such lengthy dwell times, heretofore known casings absorb relatively little liquid smoke, and can transfer only a little smoke color to the food. Consequently, browning agents must be added to conventional casings to reinforce the color. In that regard, the Examiner's attention is kindly directed to the Application-as-filed on Page 2, lines 3 through 17, in which Applicants discuss the shortcomings of DE 101 24 581 A1, whose US equivalent is US 357.

Altogether unexpectedly, Applicants have found that casing layers formed from wettable, at least moderately swellable polymers that are of sufficient thickness can absorb quite elevated amounts of liquid smoke. In that regard, Applicants respectfully reiterate that even within the same polymer family, such as the nylon family, properties such as surface energy and absorption can differ significantly. Nylon 11 is known to have a lower surface energy in comparison to nylon 6,6, for example. Nylons having more lengthy main chains, such as nylon 11 and nylon

12, are further known to absorb significantly less moisture than nylons with more closely spaced amide groups, such as nylon 6 and nylon 6,6.

Applicants have more particularly found that liquid-smoke-impregnated, tubular, single-layer or multilayered food casings comprising a single-layer which is based on polyamide and/or copolyamide alone, or comprising an inner layer based on polyamide and/or copolyamide alone, in which the inside of the casing has a surface energy of greater than 35 dyn/cm that further have a swelling value of at least 10 % may readily be impregnated on the inside with liquid smoke, such that an additional browning agent is not required.

In especially advantageous embodiments, the inventive food casings incorporate polyamide and/or copolyamide alone as a sole or inner layer having a surface energy of greater than 35 dyn/cm and either a single-layered thickness of 50 to 130 μm or a polyamide inner layer thickness of 15 to 27 μm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 wt % and the foregoing properties permit the impregnation of the casing with liquid smoke in the absence of an additional browning agent, as recited in Claim 13 as-amended.

In addition to a suitably elevated surface energy and absorbent layer thickness, Applicants have further determined that the viscosity of the liquid smoke coating can be tailored to provide highly advantageous liquid smoke coatings. Applicants have more particularly found that liquid smoke viscosity can be selected such that the resulting liquid smoke wets the inside of the casing uniformly without coalescing or forming drops, thereby providing a more uniform liquid smoke coating. In that regard, the Examiner's attention is kindly directed to the Application-as-filed on Page 4, line 17 through 21 and Page 4, line 34 through Page 5, line 1.

Accordingly, in highly beneficial embodiments, the inventive food casings are formed using liquid smoke that further comprises a viscosifier, as recited in newly added Claim 15.

In especially expedient aspects, the inventive food casings are formed using a liquid smoke having a viscosity ranging from 15 s to 18 s (measured using the Ford4 cup), as recited in newly added Claim 16.

Applicants respectfully reiterate that the claimed invention is patentable in light of the cited references, considered either alone or in combination.

Applicants further respectfully reiterate that US 357 is directed to conventional processes of applying a mixture of liquid smoke and browning agent to an at least three layered film and allowing the mixture to remain in contact with the film for at least 5 days. (Col. 1, lines 17 – 21 and Col. 2, lines 30 - 35). The coating of US 357 is formed from liquid smoke, browning agents and optional water. (Col. 3, lines 16 – 18). US 357 expressly notes the incorporation of browning agent on numerous occasions. (Col. 1, lines 17 – 18; Col. 2, lines 52 – 57; Col. 3, lines 25 – 27; Col. 3, lines 35 – 38; Col. 3, lines 43 – 60). In fact, US 357 indicates a minimum of 20 % browning agent within its coating mixture. (Col. 3, lines 37 – 38). The browning agent of US 357 is a “natural flavoring.” (Col. 3, lines 37 – 39).

US 357 discloses that its liquid smoke and browning agent mixture is allowed to “act on” the casing for at least 5 days. (Col. 3, lines 19 – 20). US 357 further notes that the application of its “particular mixture of liquid smoke and browning agent” results in an increased depth of smoke flavor penetration. (Col. 3, lines 25 – 29). US 357 indicates less absorbent nylons, i.e. nylon 11 and nylon 12, as suitable polyamides. (Col. 4, lines 34 – 37). US 357 is silent as to the surface energy of its films. As noted by the Examiner US 357 is further silent as to the thickness of its casings, as well as their water vapor permeability.

Applicants respectfully reiterate that US 357, considered as a whole, does not teach or suggest the recited liquid-smoke-impregnated food casing in which the casing is impregnated with liquid smoke, but not with an additional browning agent. Applicants respectfully reiterate that US 357, considered as a whole, clearly requires a browning agent.

Applicants further respectfully submit that the Office Action's urging on Page 3 that one skilled in the art would have been motivated to have removed the browning agent to lower costs and provide a more "environmentally conscious" product containing "fewer synthetic materials" is pure conjecture, and is altogether contrary to the express teachings of US 357, considered in its entirety. Furthermore, the browning agent of US 357 is a "natural flavoring," and thus there would have been no "environmental" reason to remove it.

Applicants further respectfully submit that the previous Office Action indicated that omission of an element is obvious if the function of the element is not desired, and that Applicants' remarks in that regard were merely making of record their traversal of this position. Applicants further respectfully reiterate that the function of the browning agent in US 357, as admitted by both US 357 and the Application-as-filed, is an increased depth of smoke color penetration in combination with liquid smoke. Applicants respectfully reiterate that an increased depth of smoke color for smoked sausage casings is highly desirable (to say the least). Hence the omission of an element thought to be required for a highly desirable function clearly evidences the patentability of the claimed invention.

And US 357 most certainly does not teach or suggest inventive food casings having a surface energy of greater than 35 dyn/cm and a swelling value of at least 10 %, much less that such food casings which are further either a single-layered film having a thickness of up to 130 μm or a multilayered film having a polyamide inner layer with a thickness of up to 70 μm would result in liquid-smoke-impregnated food casings that do not require an additional browning agent, as recited in Claim 1 as-amended. US 357 instead provides a generic list of materials, including polyamides known to have inferior absorption. US 357 is also altogether silent as to both casing thickness (as correctly noted by the Examiner) and surface energy values.

US 357 thus can not teach or suggest that food casings incorporating polyamide and/or copolyamide alone as a sole or inner layer having a surface energy of at least 35 dyn/cm and either a single-layered thickness of 50 to 130 μm or a polyamide inner layer thickness of 15 to 27 μm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 wt % would permit the impregnation of the casing with liquid smoke in the absence of an additional browning agent, as recited in Claim 13 as-amended.

Applicants further respectfully reiterate that US 357, expressly teaching both nylon 11 and nylon 12 as suitable in its invention, likewise fails to teach or suggest such inventive food casings in which the polyamide and/or copolyamide is selected from nylon 6; nylon 6,6; nylon 6/6,6; nylon 4,6; nylon 6,10; nylon 6, 12 and mixtures thereof, optionally further comprising polyether amide; polyester amide; polyether ester amide; polyamide urethane or up to 30 % by weight of at least one partially aromatic (co)polyamide, as recited in Claim 14.

US 357, merely teaching liquid smoke, browning agent and optional water, further does not teach or suggest advantageous inventive food casings formed using liquid smoke that further comprises a viscosifier, as recited in newly added Claim 15.

US 357 likewise fails to teach or suggest advantageous inventive food casings formed using liquid smoke having a viscosity ranging from 15 s to 18 s, as recited in newly added Claim 16.

Accordingly, Applicants respectfully reiterate that the claimed invention is patentable in light of US 357, considered either alone or in combination with the remaining art of record.

US 427 does not cure the deficiencies in US 357.

In contrast to the recited liquid-smoke-impregnated food casings, US 427 is directed to single-layered films with improved UV barrier. US 427 initially discloses that nylon is thought to provide “unsteady” stretching behavior. (Col. 2, lines 12 – 26). The impetus of US 427, considered in its entirety, is thus the formation of single-layered films from a mixture of polyamide, polyolefin and pigment. (Col. 3, lines 24 – 34). The polyolefin is present in amounts of up to 30%. (Col. 4, lines 59 – 61). US 427 notes the preferable incorporation of nylon 11 or nylon 12. (Col. 3, line 67 – Col. 4, line 2). US 427 touts that its films have a “relatively low” thickness, preferably ranging from about 25 to 40 microns. (Col. 6, lines 2 – 5). US 427 includes a Comparative Example formed from a single-layered film having a thickness ranging from 39 to 41 μm . (Col. 7, Comp. Ex. 1). US 427 is silent as to the swelling values and surface energy of its films.

Applicants respectfully reiterate that US 427, directed to improved UV barrier properties, does not teach or suggest the recited liquid-smoke-impregnated food casing, much less such casings impregnated with liquid smoke, but not with an additional browning agent.

And US 427 most certainly fails to teach or suggest that inventive food casings having the recited composition and surface energy of greater than 35 dyn/cm with a swelling value of at least 10 % which are further either a single-layered film having a thickness of up to 130 μm or a multilayered film having a polyamide inner layer with a thickness of up to 70 μm would result in liquid-smoke-impregnated food casings that do not require an additional browning agent, as recited in Claim 1 as-amended. US 427, merely directed casings having improved UV properties preferably incorporating less absorbent polyamide, is altogether silent as to surface energies and swelling values.

US 427 thus can not teach or suggest that food casings incorporating polyamide and/or copolyamide alone as a sole or inner layer having a surface energy of greater than 35 dyn/cm and either a single-layered thickness of 50 to 130 μm or a polyamide inner layer thickness of 15 to 27 μm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 wt % would permit the impregnation of the casing with liquid smoke in the absence of an

additional browning agent, as recited in Claim 13 as-amended. The cited passage of US 427 instead teaches a far thinner single-layered film.

US 427, teaching the preferable incorporation of nylon 11 or nylon 12, similarly fails to teach or suggest such inventive food casings in which the polyamide and/or copolyamide is selected from nylon 6; nylon 6,6; nylon 6/6,6; nylon 4,6; nylon 6,10; nylon 6, 12 and mixtures thereof, optionally further comprising polyether amide; polyester amide; polyether ester amide; polyamide urethane or up to 30 % by weight of at least one partially aromatic (co)polyamide, as recited in Claim 14.

US 427, altogether silent as to coating, further does not teach or suggest advantageous inventive food casings formed using liquid smoke that further comprises a viscosifier, as recited in newly added Claim 15.

US 427 thus can not teach or suggest advantageous inventive food casings formed using liquid smoke having a viscosity ranging from 15 s to 18 s, as recited in newly added Claim 16.

Accordingly, Applicants respectfully reiterate that the claimed invention is patentable in light of US 427, considered either alone or in combination with the remaining art of record.

The claimed invention is similarly patentable in further view of US 410.

Similar to the polyolefin blend casings of US 427, US 410 is directed to casings incorporating a polyamide layer disposed between outermost layers of polyolefin. (Col. 2, lines 5 – 10; Col. 3, lines 55 – 65; Col. 4, lines 35 – 36; Col. 4, lines 45 – 46; Col. 16, lines 6 – 9; and Col. 21, lines 3 - 14). The center polyamide layer of US 410 purportedly produces films that do not neck down during back-seaming. (Col. 3, lines 20 – 26; Col. 18, lines 17 – 18; Col. 18, lines 44 - 46). US 410 teaches that the thickness of the polyamide layer should be less than 70 % of the casing. (Col. 18, lines 19 – 24).

US 410 expressly cautions that use of polyamide in contact with food can provide “too much meat-adhesion.” (Col. 3, lines 42 – 43). Consequently, US 410 provides a food contact layer formed from anhydride-containing polyolefin to provide suitable meat-adhesion. (Col. 3, lines 44 – 55). US 410 generically notes that its polyolefin food contact layers may be corona treated, especially to increase adhesion of its films to “proteinaceous material.” (Col. 5, lines 55 – 56; Col. 27, line 64 – Col. 28, line 3 and Col. 28, lines 13 – 15). US 410 indicates on multiple occasions that its interior film layer or polymer can have a surface energy of less than about 34 dyne/cm. (Col. 6, lines 20 – 26; Col. 17, lines 15 – 20; Claim 27 and Abstract). In fact, US 410 teaches that the polymer used to form the interior of its films preferably has a surface energy of less than 32 dyne/cm. (Col. 6, lines 42 – 44 and Col. 17, line 18).

The outstanding Office Action indicates at Page 10, Ref. No. 24 that it would have been obvious to have corona treated the inventive polyamide sausage casings in light of US 410 in order to provide sufficient meat adhesion.

Applicants respectfully reiterate US 410 clearly does not teach the use of corona treatment in combination with polyamides, as US 410 expressly cautions that untreated polyamides alone already provide “too much meat-adhesion.” US 410 does provide list of polar polymers that generically includes polyamide; however, US 410 further teaches the use of such polar polymers or surface treatment. Considered in its entirety, particularly its express teaching of polyamides as providing too much meat-adhesion, Applicants respectfully submit that one skilled in the art would, at best, have considered the use of polyamide and surface treatment as alternatives to imparting increased surface energy.

US 410 thus does not teach or suggest the claims as-amended.

US 410, broadly directed to films having improved processing characteristics, does not teach or suggest the inventive liquid-smoke-impregnated food casings, much less such casings impregnated on the inside with liquid smoke, but not with an additional browning agent.

US 410, requiring polyolefin layers in contact with food, further does not teach or suggest liquid-smoke-impregnated food casings comprising a single-layer whose polymer is based on polyamide and/or copolyamide alone, or comprising an inner layer whose polymer is based on polyamide and/or copolyamide alone. Applicants respectfully reiterate that US 410 teaches away from such casings by indicating that polyamide imparts “too much meat-adhesion” within the food-contact layer and incorporating polyolefin in lieu thereof. Applicants additionally respectfully submit that to modify US 410 so as to avoid its required polyolefin within its food-contact layer would render it unfit for its intended purpose.

And US 410 most certainly does not teach or suggest such polyamide and/or copolyamide casings in which the inside of the casing has a surface energy of greater than 35 dyn/cm, as recited in Claim 1 as-amended. US 410 instead expressly teaches film layers having a surface energy of less than 32 dyn/cm.

Nor does US 410 teach or suggest that polyamide and/or copolyamide casings having the recited surface energy and either a single-layered thickness of 20 to 130 μm or inner layer thickness of 15 to 70 μm and a swelling value of at least 10 % could be used to form liquid-smoke-impregnated food casings in the absence of an additional browning agent, as further recited in Claim 1 as-amended.

US 410 thus can not teach or suggest that food casings incorporating polyamide and/or copolyamide alone as a sole or inner layer having a surface energy of greater than 35 dyn/cm and either a single-layered thickness of 50 to 130 μm or a polyamide inner layer thickness of 15 to 27 μm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 wt % would permit the impregnation of the casing with liquid smoke in the absence of an additional browning agent, as recited in Claim 13 as-amended.

US 410 likewise does not teach or suggest advantageous inventive food casings formed using liquid smoke that further comprises a viscosifier, as recited in newly added Claim 15.

And US 410 can not teach or suggest advantageous inventive food casings formed using liquid smoke having a viscosity ranging from 15 s to 18 s, as recited in newly added Claim 16.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 410, considered either alone or in combination with the remaining art of record.

The claimed invention is likewise patentable in further light of US 295.

US 295 is directed to sausage casings that avoid tightening lubricating agents and moisture retaining agents. (Col. 2, lines 62 – Col. 3, line 2). In contrast to the inventive smoke-containing casings, US 295 expressly states that its casings contain “no additional additives,” other than water. (Col. 5, lines 28 – 31). US 295 indicates absorption of up to 8 % water for polyhexamethylene adipamide. (Col. 5, lines 15 – 18).

US 295, generically directed to casings avoiding lubricating and moisture retaining agents that further contain no additional additives, does not teach or suggest inventive liquid-smoke-impregnated food casings, much less that casings incorporating polyamide or co-polyamide which further exhibit a surface energy of at least 35 dyn/cm may be impregnated on the inside with liquid smoke in the absence of an additional browning agent.

Nor does US 295 teach or suggest that liquid-smoke-impregnated food casings could be formed from either single-layered polyamide casings having a thickness of 20 to 130 μm or multilayered casings incorporating an polyamide inner layer having a thickness of 15 to 70 μm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 %, as further recited in Claim 1 as-amended.

US 295 thus can not teach or suggest that food casings incorporating polyamide and/or copolyamide alone as a sole or inner layer having a surface energy of greater than 35 dyn/cm and either a single-layered thickness of 50 to 130 μm or a polyamide inner layer thickness of 15 to 27

µm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 wt % would permit the impregnation of the casing with liquid smoke in the absence of an additional browning agent, as recited in Claim 13 as-amended.

US 295, expressly teaching no additional additives are present other than water, likewise does not teach or suggest advantageous inventive food casings formed using liquid smoke that further comprises a viscosifier, as recited in newly added Claim 15.

US 295 likewise fails to teach or suggest advantageous inventive food casings formed using liquid smoke having a viscosity ranging from 15 s to 18 s, as recited in newly added Claim 16.

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 295, considered either alone or in combination with the remaining art of record.

Applicants respectfully reiterate that there would have been no motivation to have combined US 357, US 427, US 410 and US 295. US 357 is directed to food casings containing a mixture of liquid smoke and browning agent. US 427 is directed to UV resistant food casings that include polyolefin. US 410 is directed to films that do not neck down during back-seaming having a polyolefin food-contact-layer. US 295 is directed to sausage casings avoiding tightening lubricating agents and moisture retaining agents. These are also altogether different problems solved.

However, even if one had combined US 357, US 427, US 410 and US 295 (which they did not), the claimed invention would not result.

The combination more specifically fails to teach or suggest that food casings incorporating polyamide or co-polyamide alone as a sole or inside layer having a surface energy of greater than 35 dyn/cm and either single-layered thickness of 20 to 130 μm or a polyamide inner layer thickness of 15 to 70 μm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 % would permit the impregnation of the casing with liquid smoke in the absence of an additional browning agent, as recited in Claim 1 as-amended. US 357 requires a browning agent. US 410 teaches film layers having a surface energy of less than 32 dyne/cm. US 295 teaches absorption of 8 % water.

The combination thus can not teach or suggest that food casings incorporating polyamide and/or copolyamide alone as a sole or inner layer having a surface energy of greater than 35 dyn/cm and either a single-layered thickness of 50 to 130 μm or a polyamide inner layer thickness of 15 to 27 μm in which the casing or the polyamide inner layer of the casing has a swelling value of at least 10 wt % would permit the impregnation of the casing with liquid smoke in the absence of an additional browning agent, as recited in Claim 13 as-amended. As noted above, US 357 requires a browning agent. The cited comparative example of US 427 teaches use of far thinner mono-layered casings. US 410 teaches film layers having a surface energy of less than 32 dyne/cm. US 295 teaches absorption of 8 % water.

And the combination most certainly does not teach or suggest advantageous inventive food casings formed using liquid smoke that further comprises a viscosifier, as recited in newly added Claim 15.

The combination thus can not teach or suggest advantageous inventive food casings formed using liquid smoke having a viscosity ranging from 15 s to 18 s, as recited in newly added Claim 16.

Accordingly, Applicants respectfully reiterate that the claimed invention is patentable in light of US 357, US 427, US 410 and US 295 considered either alone or in any combination.

CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1, 3 through 8 and 12 through 16 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,

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